



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/821,857	04/12/2004	Norihisa Naganuma	1448.1056	1803
21171	7590	05/06/2005	EXAMINER	
STAAS & HALSEY LLP SUITE 700 1201 NEW YORK AVENUE, N.W. WASHINGTON, DC 20005			CHANG, AUDREY Y	
			ART UNIT	PAPER NUMBER
			2872	

DATE MAILED: 05/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/821,857

Applicant(s)

NAGANUMA ET AL.

Examiner

Audrey Y. Chang

Art Unit

2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned-patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 4/12/2004

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_

## DETAILED ACTION

### *Claim Objections*

1. **Claims 6 and 9 are objected to because of the following informalities:**

(1). The phrase "the diffraction units are edges" recited in claim 6 is very confusing and indefinite since it is not clear how could the diffraction units be edges?

(2). Claim 9 is very confused since it is not clear how could the incident light and the reflected light by the filter be in the same direction, if it is reflected the light will be either in counter-propagated direction or in other direction with respect to the incident direction.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. **Claims 11 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by the patent issued to Liou (PN. 6,292,299).**

Liou teaches a tunable optical add/drop device that is comprised of an *optical filter* (100, Figure 3) arranged in the path of a *collimated beam*, (collimated by the collimator 350), wherein the filter has an *edge*, (defined between the filter region 110 and the reflective region 120), and it is implicitly true that the transmittance with respect to a wavelength is set by the filter arrangement. Liou teaches that the filter may be moved by a *positioner* (325) such that the edge of the filter may certainly be moved between a center and an edge of the collimated beam. The add/drop device is a wavelength divisional multiplexing add/drop system that is applied in an optical communication system.

Art Unit: 2872

Liou does not teach explicitly that the device is also an optical amplifier. However, it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Madham*, 2 USPQ2d 1647 (1987).

This reference has therefore anticipated the claims.

4. Claims 11 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by the patent issued to Fukushima (PN. 5,805,759).

Fukushima teaches an *optical device* that is comprised of an *optical filter* (6, Figures 4, and 7(C)) that is placed in the beam path of a *collimated beam* wherein the optical filter has an *edge* (defined by the slit 42, of Figure 7(C)). It is implicitly true that the transmittance with respect to a wavelength is set by the filter arrangement. Fukushima teaches that the filter may be moved by a *driver* (32) such that the edge of the filter may certainly be moved between a center and an edge of the collimated beam, (please see Figures 6-7). The optical device is a wavelength divisional multiplexing optical system (WDM) that is applied in an optical communication system, (please see column 1-2). Fukushima also teaches that the device is an optical equalizer which has the function of an optical amplifier, (please see columns 1-2 and 9).

This reference has therefore anticipated the claims.

#### *Claim Rejections - 35 USC § 103*

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Fukushima (PN. 5,805,759) in view the patent issued to Shikama et al (PN. 4,835,761).

Fukushima teaches an *optical device* that is comprised of an *optical filter* (6, Figures 4, and 7(C)) that is placed in the beam path of a *collimated beam* wherein the optical filter has pair of *edges* (defined by the slit 42, of Figure 7(C)). Fukushima teaches that the optical filter is a variable filter such that the transmittance is variable with respect to wavelength, (please see Figure 7(D)). Fukushima teaches that the filter may be moved by a *driver* (32) in a direction that is *perpendicular* to the direction of the collimated beam, (please see Figures 6-7, column 6, lines 54-55). With regard to claim 2, Fukushima teaches that the optical filter (6) comprises a slit (42) having a pair of edges.

This reference has met all the limitations of the claims with the exception that it does not teach *explicitly* that the optical filter with the slits and edges is a diffraction unit. Fukushima teaches that the optical filter is an attenuation filter. Shikama et al in the same field of endeavor teaches that an attenuation optical filter can assume the form of a diffraction unit with a plurality of edges and slits, (please see Figure 8). It would then have been obvious to one skilled in the art to apply the teachings of Shikama et al to modify the attenuation optical filter of Fukushima to include a plurality of slits and edges as the diffraction units for the benefit of providing an attenuation optical filter having specific attenuation or filtering properties with respect to the wavelength for the collimated light beam, defined by the diffraction units.

With regard to claims 3-5, Fukushima teaches that a plurality of the attenuation optical filters (6, Figure 9) may be used wherein each of the optical filters is individually driven by the driver to move in the direction perpendicular to the direction of the collimated light beam. Fukushima teaches that each of the plurality of optical attenuation filters has specific slit patterns (please see Figures 5-7) and they are driven to provide specific transmittance characteristics, (please see Figures 10). Although this reference

does not teach explicitly that the slits for different filters are arranged at certain angle with respect to each other such modification would have been obvious to one skilled in the art for the benefit of deigning the optical device with the filters to have the desired transmittance characteristics with respect to the wavelength.

With regard to claim 4, Fukushima teaches that the light attenuation region lines (ETL) with certain pitch as relative to the beam spot size (SP) is set to be less than one quarter of the beam spot size, (please see Figures 5-6). It would then have been obvious to make the grating structure of the attenuation optical filter with edges to have the pitch to be less than a quarter of the beam size for the benefit of enabling the attenuation filter to provide desired wavelength transmittance pattern.

With regard to claim 7, this reference does not teach explicitly that the driver is the types of driver claimed however these claimed drivers are all well known standard drivers in the art to use one of them would have been obvious modification to one skilled in the art for the benefit of effectively moving the optical filter as desired.

With regard to claim 8, it is implicitly true the different arrangements of the edges and slits for the attenuation optical filters result different wavelength characteristics.

With regard to claim 9, a reflective mode of the optical filter as demonstrated by the teachings of Shikama et al certainly can be used to provide a reflection mode of the optical equalizer.

**7. Claims 1-2 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Liou (PN. 6,292,299).**

Liou teaches a *tunable* optical add/drop device that is comprised of an *optical filter* (100, Figure 3) arranged in the path of a *collimated beam*, (collimated by the collimator 350), wherein the filter has an *edge*, (defined between the filter region 110 and the broadband reflective region 120). Liou teaches that the filter may be moved by a *positioner* (325) in the direction *perpendicular* to the direction of the

collimated light beam such that the filter is tuned to have variable characteristics with respect to the wavelength. Liou teaches that the optical filter may be of a Fabry-Perot etalon and the filter regions (110) is formed on the reflective film of the etalon, (with regard to claim 10).

This reference has met all the limitations of the claims with the exception that it does not teach explicitly that the optical filter having a diffraction unit and slit with pair of edges. However Liou does teach that the filter region (110) can be formed by discrete filters each having a band-pass characteristics to unique wavelength that is ganged or grouped to form the filter region (110) wherein *each* of the ganged filter is *adjacent* to the broadband reflector (120, please see column 2, lines 65-column 3 line 5) which means that a plurality of the ganged filters each adjacent to the reflector region (120) can be formed which essentially formed a diffraction unit, (i.e. multiple filter regions and reflective regions). Liou teaches that the edge between the filter region and the reflector region formed a step this means by having a plurality of the filter regions (110) and the reflector regions (120) interlacing each other a plurality of slits with edges will be formed. It would then have been obvious to one skilled in the art to modify the optical filter to have a plurality of filter regions (110) and broadband reflector regions (120), interlaced with each other, for the benefit of making the tunable filter capable of tuning the incident collimated light beam with more desired optical characteristics.

#### *Contact Information*

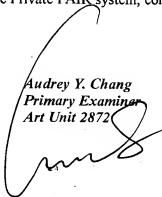
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2872

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*Audrey Y. Chang*  
*Primary Examiner*  
*Art Unit 2872*



A. Chang, Ph.D.